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EPA East- Room 6428 Attn: Section 8(e)
Office of Pollution Prevention and Toxics
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington DC 20460-0001

RE: **8EHQ-0501-14871B**
8EHQ-0204-14871C
8EHQ-0403-15211C
8EHQ-0204-15211D

To Whom It May Concern:

In two letters dated March 4, 2004, you requested additional information on the uses of the tested product and other available information to assist EPA in assessing potential exposures, as well as any voluntary risk assessment actions by our company.

The mixed calcium salts of the alkyl-salicylate and alkyl-phenate detergents (Carboxylate) described in the 8(e) submissions shown above are used to formulate marine diesel engine lubricating oils. Carboxylate detergents are used to reduce deposits on pistons and in the engine crankcase and to control oxidation of the lubricant from high temperatures. These detergents are but one of the components used to formulate additive packages used to produce finished lubricants used in the global marine engine marketplace.

The Carboxylate can be detected by the use of calcium analysis down to about 10 to 20 parts per billion using Inductively Coupled Plasma Atomic Emission Spectroscopy or Atomic Absorption. Other ASTM Methods such as Total Base Number (ASTM 2896) can be used to measure the presence of the Carboxylate.

Life Cycle of Carboxylate Detergents

The complete life cycle of this product encompasses the following activities:

- It is manufactured in the United States at one facility at
- At this manufacturing plant, the Carboxylate is stored in a dedicated tank after manufacture until it is either 1) loaded for shipment to customers as a bulk chemical (i.e., 100% of itself), 2) blended into five different additive packages (in concentrations ranging from 60 to 80% of Carboxylate) that then are loaded for shipment, or 3) totally consumed as a raw material used to make a sulfurized detergent.
- The product is shipped as a bulk chemical or an additive package by rail or tank truck to 5-15 blending plants owned by three customers.
- At these blending plants, the customer blends either the additive package into finished oils or blends the bulk component with other additives into finished oils. The concentration of Carboxylate in these finished oils ranges from 1 to 20%.
- At the customers' blending plants, the finished oils are stored in tanks until shipment to the end user.
- Finished oils are shipped by our customers by tank truck or 55-gallon drums to the end users' sites at major seaports.
- At the end users' sites, the finished oil is either stored in an onshore tank until used or pumped into a tank directly on board ship.
- Once the finished oil is in a tank aboard ship, it is transferred to the engine oil sump and used to lubricate 1000 to 10,000 HP marine diesel engines.

- During the use of the marine lubricant, the Carboxylate detergent is thermally stable and is not altered substantially, and it does not decompose in the engine crankcase. During lubrication, Carboxylate detergents are attracted to and coat insoluble materials (soot particles, insoluble resins, etc.) and are filtered out of the oil. Over time, the predictable loss of detergency properties in these oils is replaced as fresh oil is added to keep oil sump levels constant. In addition, marine diesel engine oils are burned in the engine during oil consumption, and most of the resulting ash will be returned to the sump as insoluble material or emitted as particles in the exhaust.
- Used oils are drained from marine diesel engines during maintenance or overhaul, which occurs only once every 18-24 months.
- Used marine diesel engine oil is usually incinerated or re-refined, and both processes effectively destroy Carboxylate detergents and all other lubricant additives.

Risk Management Actions

The hazards associated with this Carboxylate detergent and additive packages that contain > 1.0% (w/w) of it are appropriately communicated in the Material Safety Data Sheet to employees in its manufacturing and blending facilities. The MSDS also accompanies the bill of lading for each shipment and is sent to each customer. Toxicologists also personally communicate their counterparts in our customers companies to explain these hazards and how they would impact our customers finished oils. The following actions are also taken at each stage of the life cycle enumerated above to mitigate potential exposures and manage potential risks to human health and the environmental:

Carboxylate Manufacturing and Storage Activities at

- Plant workers typically wear personal protective equipment in the manufacturing plant that includes chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats.
- Manufacture occurs in a closed reaction vessel that eliminates worker exposure.
- The product is transferred from the reaction vessel to storage tanks by dedicated piping.
- Samples for product quality assurance test are taken from a small valve between the reaction vessel and the storage tank that is enclosed to minimize the potential for splashing by two workers using the personal protective equipment listed above. The sampling process takes approximately 10 minutes. QA samples are analyzed by laboratory personnel who wear personal protective equipment that includes chemical safety glasses, chemical-resistant gloves, and lab coats.
- All pipes, storage tanks and delivery systems are cleaned by flushing the line with lube oil and pigging the lines to remove residual oil. All the flush oil is collected an sent to be re-refined into fresh lube oil. Any residual Carboxylate and other additive substances generally end up as a bottoms asphaltic product used in road paving.
- The reactor and storage tank may be entered occasionally to affect repairs or maintenance by personnel wearing the personal protective equipment described for plant workers above. Prior to entry, the equipment is first flushed with lube oil, which is added to the crude product. The equipment is then washed with water or cleaned with steam.
- All waste water from the cleaning operation is sent to a state-of-the-art waste water treatment facility consisting of two API oil/water separators in series, induced air flotation, aeration with carbon (biooxidation) and clarification by sand filtration before discharge to the
- All solids collected during the cleaning operations are incinerated.
- All of the waste oil is collected and sent to be re-refined into fresh lube oil as described above.

Additive Package Blending and Storage Activities at

- Blending is done using a computer-controlled inline blending system by plant operators in isolated operations rooms. If these individuals need to leave the operations room, they wear the same personal protective equipment including chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats as other plant workers described above.
- The individual additives are pumped continuously from their storage tanks through computer-controlled valves which meter the precise delivery of the additive components into a 12 inch pipe

approximately 10 to 15 meters long, and the resulting products are pumped through mixing baffles to ensure that the package is completely blended into a storage tank. The inline blender allows rapid blending in a "just-in-time" delivery mode of the specific additive package that has been ordered and eliminates all worker exposure during the blending process.

Loading and Shipping Activities from to Customer Blending Plants

- Additive packages or the bulk additive are pumped by one plant worker wearing the personal protective equipment described above into tank trucks or railroad tank cars.
- A flexible 4-inch hose is used to connect the hard piping (that delivers the blended product from the storage tank) to the tank truck or railroad tank car in a way that minimizes worker exposure. It takes less than 10 minutes to connect this hose to the tank truck or railroad tank car.
- The hose is automatically pigged to the tank trucks or railroad tank cars with lube oil.
- When loading is complete, the hose is disconnected following Special ISO 9001 procedures to minimize any spills. It takes less than 10 minutes to disconnect this hose from the tank truck or railroad tank car.
- If a spill occurs, it is washed with steam into the waste water system and treated as described above.
- The hose end is kept on an oily drain when not in use. The oily drain contents are sent into the waste water treatment system and treated as described above.
- Samples for product quality assurance tests are taken from the tank truck or railroad tank car by two workers wearing the same personal protective equipment including chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats as other plant workers described above. The sampling process takes approximately 10 minutes.
- The samples are analyzed by laboratory personnel who wear the same personal protective equipment that includes chemical safety glasses, chemical-resistant gloves, and lab coats described above.
- All tank truck operators go through rigorous training and are audited annually for compliance to strict Product Stewardship and Distribution Codes.
- All cleaning of tank trucks and railroad tank cars that have delivered their loads is done at our plant to ensure careful control of the waste water that is generated during cleaning.
- All waste water from the cleaning operation is sent to the state-of-the-art waste water treatment system and treated as described above.

Unloading and Storage Activities at Customer Blending Plants

- The bulk Carboxylate detergent or Additive packages that contain it are pumped from the delivering tank truck or railroad tank car using essentially the reverse of the loading procedure.
- The bulk component or additive package is transferred to a storage tank through a 4-inch hose by one worker who wears the same personal protective equipment including chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats used by plant workers described above. It takes approximately 10 minutes to fasten the end of the unloading hose to the tank truck or railroad tank car.
- When loading is complete, the hose is disconnected following Special ISO 9001 procedures to minimize any spills. It takes less than 10 minutes to disconnect this hose from the tank truck or railroad tank car.
- If a spill occurs, it is washed with steam into a waste water system and treated as described above.
- The hose end is kept on an oily drain when not in use. The oily drain contents are sent into a waste water treatment system and treated as described above.
- The treated water is sent to municipal sewers, and the hydrocarbon portion is sent to an incinerator or is re-cycled.

Blending Activities at Customer Plants

- Finished oil blending is done using a computer-controlled inline mixer or blending tank by plant operators in isolated operations rooms. If these individuals need to leave the operations room, they wear the same personal protective equipment including chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats as other plant workers described above.
- All worker exposure is eliminated by pumping the lubricating oil blend stocks and the additive package from their storage tanks through computer controlled valves that meter the precise delivery of the components into an in-line mixer or a blending tank at 60°C.
- After blending, the finished oil is sampled for Quality Assurance from the run-down tank or the blend tank by one or two plant workers wearing same personal protective equipment including chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats described for plant workers above.
- The finished lubricant analysis is done in a laboratory by one or two workers who wear personal protective equipment that includes chemical safety glasses, chemical-resistant gloves, and lab coats.
- Cleaning of the blend tank or in-line blender is done with lube oil that is either recycled into future blends or is incinerated or re-cycled.

Finished Oil Shipping Activities at Customer Plants

- After analysis is complete, the finished oils are packaged into 55 gallon drums for shipment or shipped in bulk in tank trucks.
- Worker exposure may occur at the drumming facility as the operator watches (from about 10 feet away) to insure the drum filling mechanism properly enters the drums before the drum is filled. Although automated weight scales are used to fill the drums and the filling mechanism is designed to eliminate splashing, bungs and labels are put into place by the operators who wear chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats to minimize exposure to the finished oil. We believe that up to 250 people are involved in these activities in the United States.
- The cleaning of the packaging lines is done with lube oil and this oil is typically recycled during future blending operations or is incinerated or re-cycled.
- Worker exposure may also occur during loading of the bulk lubricant into tank trucks. The bulk lubricant loading involves the connection of a 4-inch line to the truck and removal of the line after completion of the tank filling as already described above for other loading operations.
- The delivery lines are placed over oily drains that catch any spilled product. The oily drain contents are sent into a waste water treatment system and treated as described above.

Finished Oil Delivery to and Use by the End User

- The finished oils are pumped from the delivering tank truck or from a 55-gallon drum using essentially the reverse of the loading procedures into onshore storage tanks.
- The finished oil is transferred to a storage tank through a 4-inch hose by one worker who wears the same personal protective equipment including chemical safety glasses, chemical-resistant gloves and coveralls, and hard hats used by plant workers described above. It takes approximately 10 minutes to fasten the end of the unloading hose to the tank truck.
- When unloading is complete, the hose is disconnected following Special ISO 9001 procedures to minimize any spills. It takes less than 10 minutes to disconnect this hose from the tank truck.
- If a spill occurs, it is washed with steam into a waste water system and treated as described above.
- The hose end is kept on an oily drain when not in use. The oily drain contents are sent into a waste water treatment system and treated as described above.
- The treated water is sent to municipal sewers, and the hydrocarbon portion is sent to an incinerator or is re-cycled.
- From the onshore storage tank, the finished oil is loaded to the storage tank aboard tug boats, ferries, and small- to medium-sized ocean-going diesel powered vessels. The employees of these end users are considered to be skilled tradesmen and are trained in the appropriate use of

engineering controls and personal protective equipment to mitigate potential exposure to finished oils.

- The finished oil is transferred from the onboard storage tank to the engine oil sump by dedicated piping that eliminates human exposure.

Activities that Generate Used Oil for Disposal

- Under normal engine operating conditions, used oil is consumed during the engine combustion process.
- Used oils may be drained and collected during engine overhauls by skilled tradesmen sho are trained in the appropriate use of engineering controls and personal protective equipment to mitigate potential exposure to used oils. .
- Used oils are usually incinerated or re-refined.
- Improper disposal of used oil will cause environmental exposures.

If you have any additional questions, please contact me at the above numbers.

Sincerely,